

# (12) UK Patent Application (19) GB (11) 2 277 857 (13) A

(43) Date of A Publication 16.11.1994

(21) Application No 9309969.5

(22) Date of Filing 14.05.1993

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(51) INT CL<sup>5</sup>

A01D 7/10

(52) UK CL (Edition M )

A1B B1D

(56) Documents Cited

GB 2234656 A

GB 0883122 A

GB 0593436 A

GB 0470987 A

US 4059945 A

(58) Field of Search

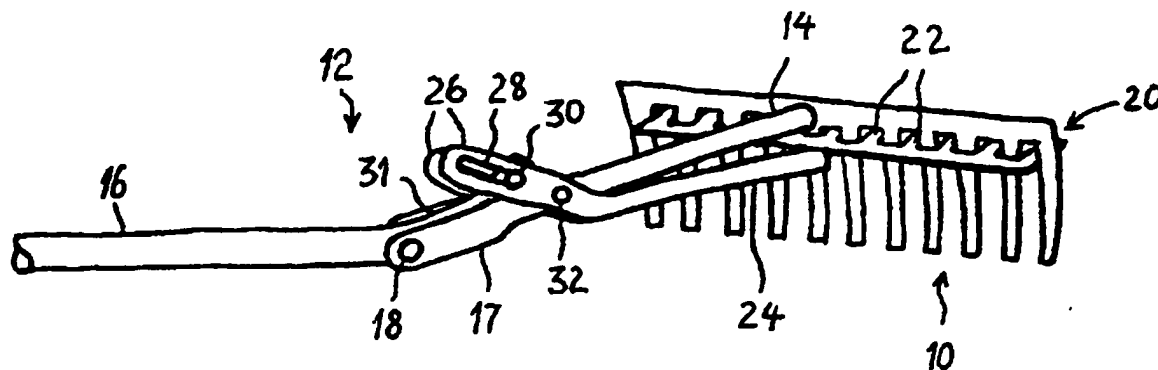
UK CL (Edition L ) A1B B1D

INT CL<sup>5</sup> A01D 7/00 7/10

(54) Garden rake

(57) The rake has a row of teeth 10 for gathering debris and interposed cleaning elements 22 moveable relative to the teeth for removing accumulated debris from between the teeth. The rake may comprise a bipartite handle comprising a head portion 14 which bears the row of teeth 10 and which is attached to a handle portion by a first pivot 18, and a shaft 24 bearing the cleaning elements 22 attached to the head portion 14 at a second pivot 32 and to the handle portion by a slideable third pivot 26 located at the end of the shaft. In use, a scissor movement about the second pivot 32 automatically cleans the teeth at the end of each stroke.

FIG. 1a



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FIG. 1a

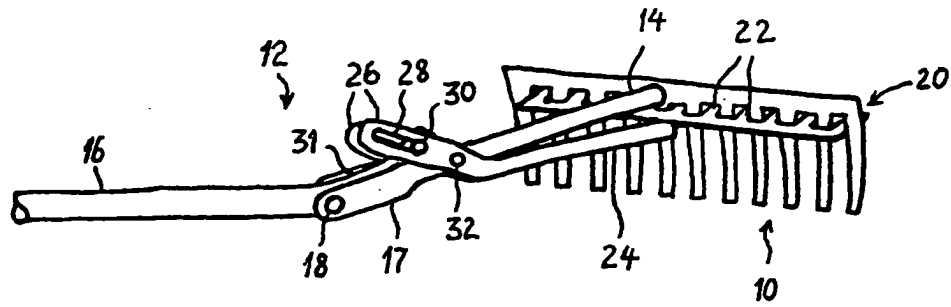
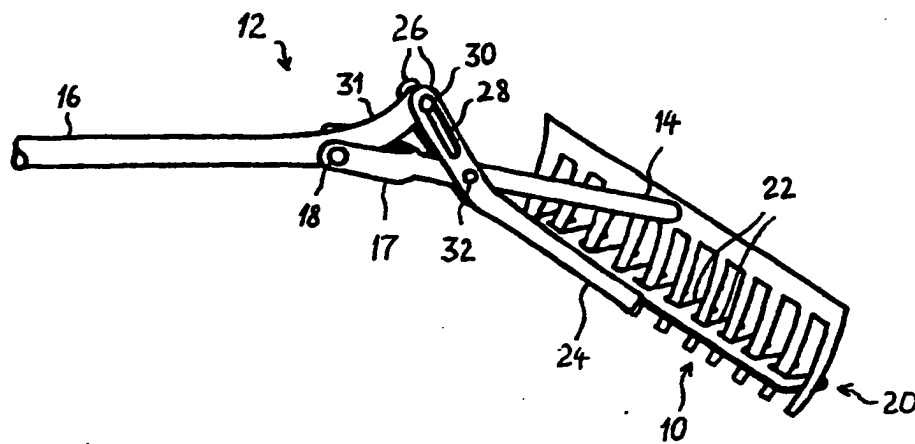


FIG. 1b



IMPROVED RAKE

The present invention relates to improved rakes, and in particular to garden rakes which automatically remove  
5 garden debris (e.g. moss, leaves and wet grass cuttings) from between the teeth of the rake on lifting the rake at the end of each stroke.

A common problem encountered during raking is blockage of  
10 the teeth of the rake by debris and in particular moss, leaves and wet grass cuttings. Such blockage reduces the efficiency of raking, and necessitates regular cleaning of the teeth. This is usually accomplished by picking out the debris by hand. However, such an operation is  
15 laborious and can be dangerous, e.g. the debris may contain sharp thorns which can cause splinters and even serious infection (caused by the tetanus bacterium, which is very common in garden soil).

20 It is therefore an object of the present invention to provide an improved rake which is self-cleaning and which avoids the need to remove debris from the teeth of the rake by hand.

25 According to the present invention, there is provided a rake comprising a head having a row of teeth for

gathering debris, interposed cleaning elements being provided moveable relative to the teeth for removing accumulated debris from between the teeth. Preferably, the cleaning elements comprise a second row of teeth  
5 interdigitated with the teeth on the head.

The rake may further comprise a handle upon which is pivotally mounted a shaft bearing the cleaning elements. In such an arrangement, the shaft may be mounted in a  
10 scissor-type arrangement on the handle, cleaning of the rake being effected by movement of the cleaning element-distal part of the shaft relative to the handle. Alternatively, the shaft may be connected to a sliding element mounted on the handle such that sliding the  
15 element causes movement of the shaft. In such embodiments, cleaning of the rake is effected by a cleaning routine on the part of the user, the latter embodiment involving a sliding movement similar in some respects to that employed during the wringing of the  
20 well-known squeezable mops.

In a preferred embodiment, the rake comprises; (a) a bipartite handle comprising a head portion which bears the row of teeth and which is attached at the teeth-  
25 distal end to a handle portion at a first pivot, and (b) a shaft bearing the cleaning elements which is attached

to the head portion at a second pivot and to the head-proximal end of the handle portion at a slidable third pivot located at the cleaning element-distal end of the shaft; the pivots being arranged such that in use a  
5 raking action produces a moment about the first pivot which tends to draw the shaft bearing the cleaning elements towards the head portion in a scissor movement about the second pivot via a force acting on the slidable third pivot, and lifting the rake at the end of each  
10 raking stroke produces a moment about the first pivot by dint of the combined weight of the head portion and teeth which tends to draw the shaft bearing the cleaning elements away from the head portion in a scissor movement about the second pivot via a force acting on the slidable  
15 third pivot, thereby automatically cleaning the teeth at the end of each stroke.

The invention will now be described in more detail by way of example with reference to the accompanying drawings,  
20 in which:

Figure 1a is a perspective view of the rake according to the invention in raking conformation,

25 Figure 1b is a perspective view of the rake according to the invention in cleaning conformation.

The drawings are for illustrative purposes only and are in no way intended to limit the scope of the invention.

Figure 1a illustrates the rake in the raking  
5 conformation, in which state leaves, grass and other debris are collected by dragging the rake along the surface to be raked in the usual fashion.

The rake comprises a row of teeth 10 arranged in the form  
10 of a comb. The handle 12 is bipartite, comprising a head portion 14 which carries the teeth and a handle portion 16 which is shown in truncated form. The head portion 14 bifurcates at the teeth-distal end, the fork 17 embracing the handle portion 16 and joined to it at pivot 18.

15

The rake further comprises a cleaning element 20 in the form of a comb having teeth 22 interdigitated with the teeth 10. The cleaning element is mounted on a shaft 24 which is of U-shaped cross section and which opens at the  
20 cleaning element-distal end to form two arms 26. Each of the two arms are pierced by a slot 28 which receives a through-pin 30 to form a slidable pivot with an upwardly curved region 31 of the handle portion. The cleaning element-distal end of the shaft is also joined to the  
25 head portion of the handle at pivot 32.

While the rake is being drawn over the surface to be raked, a degree of downward pressure is exerted on the handle 16 in order to keep the teeth 10 in contact with the surface to be raked. This produces a moment about the pivot 18 which forces the pin 30 down the slot 28 thus tending to draw the shaft 24 bearing the interdigitated teeth 22 towards the head portion 14 in a scissor movement about the pivot 32. The head portion 14 is partially accommodated in the U section of the shaft 24 during this movement.

In this conformation, the teeth of the rake 10 are free to collect debris, which accumulates between the teeth and below the cleaning element 20 and its interdigitated teeth 22.

Figure 1b shows the rake in the cleaning conformation, which is adopted automatically at the end of a raking stroke. The components are numbered as for Figure 1a.

20

Lifting of the rake at the end of a raking stroke produces a moment about the pivot 18 by dint of the combined weight of the head portion 14 and teeth 10. This forces the pin 30 up the slot 28 thus tending to draw the shaft 24 bearing the interdigitated teeth 22 away from the head portion 14 in a scissor movement about the pivot

32. This movement draws the interdigitated teeth 22 along the row of teeth 10 towards their free ends, the interdigitated teeth 22 thus acting as a comb to push out from between the teeth 10 any accumulated debris.

5

The displaced debris thus forms a discrete pile beneath the row of teeth 10 at the end of each stroke, in which form it can be easily collected and disposed of.

- 10 The handle portion 16 may be of metal tubular construction. Alternatively, it could be of composite construction, having a truncated metal tubular teeth distal end for receiving a wooden pole which acts as a handle for the user. The teeth 10 are preferably metal  
15 (for durability), but the cleaning element 20 may be of plastics construction (for lightness and consequent ease of operation).



CLAIMS:

1. A rake comprising a head having a row of teeth for gathering debris, interposed cleaning elements being  
5 provided moveable relative to the teeth for removing accumulated debris from between the teeth.

2. A rake according to claim 1 wherein the cleaning elements comprise a second row of teeth interdigitated  
10 with the teeth on the head.

3. A rake according to claim 1 or claim 2 further comprising a handle upon which is pivotally mounted a shaft bearing the cleaning elements.

15

4. A rake according to claim 3 wherein the shaft is mounted in a scissor-type arrangement on the handle, cleaning of the rake being effected by movement of the cleaning element-distal part of the shaft relative to the  
20 handle.

5. A rake according to claim 3 wherein the shaft is connected to a sliding element mounted on the handle such that sliding the element causes movement of the shaft.

25

6. A rake according to claim 1 or claim 2 further

comprising;

(a) a bipartite handle comprising a head portion which bears the row of teeth and which is attached at the teeth-distal end to a handle portion at a first pivot,

5 and

(b) a shaft bearing the cleaning elements which is attached to the head portion at a second pivot and to the head-proximal end of the handle portion at a slidable third pivot located at the cleaning element-distal end of the shaft; the pivots being arranged such that in use a raking action produces a moment about the first pivot which tends to draw the shaft bearing the cleaning elements towards the head portion in a scissor movement about the second pivot via a force acting on the slidable third pivot, and lifting the rake at the end of each raking stroke produces a moment about the first pivot by dint of the combined weight of the head portion and teeth which tends to draw the shaft bearing the cleaning elements away from the head portion in a scissor movement about the second pivot via a force acting on the slidable third pivot, thereby automatically cleaning the teeth at the end of each stroke.

7. A rake according to any of the preceding claims in which the handle is a socket adapted to receive a handle extension.

8. A rake substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)** -10-

Application number  
 GB 9309969.5

**Relevant Technical fields**

(i) UK CI (Edition L ) A1B (B1D)

(ii) Int CI (Edition 5 ) A01D 7/00; 7/10

**Search Examiner**

K J KENNETT

**Databases (see over)**

(i) UK Patent Office

(ii)

**Date of Search**

8 JULY 1993

Documents considered relevant following a search in respect of claims 1-8

| Category<br>(see over) | Identity of document and relevant passages | Relevant to<br>claim(s) |
|------------------------|--|-------------------------|
| X                      | GB 2234656 (VICKERS) - whole document      | 1                       |
| X                      | GB 883122 (McMULLAN) - Figures 1 and 2     | 1-5                     |
| X                      | GB 593436 (DALEO - page 3 line 44          | 1-3 and 5               |
| X                      | GB 470987 (DARLINGTON) - Figure 1          | 1                       |
| X                      | US 4059945 (MARTINEZ) - whole document     | 1-3 and 5               |

| Category | Identity of document and relevant passages - 11 - | Relevant to claim(s) |
|----------|---|----------------------|
|          |   |                      |

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